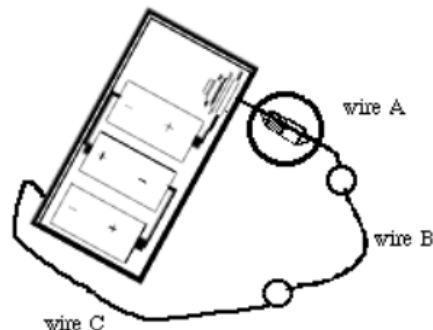


Compass Activity

Exploring The Direction of Electrical Current

| | Initial Battery Position | | Reversed Battery Position | |
|--------|--------------------------|-----------|---------------------------|-----------|
| | Direction | Magnitude | Direction | Magnitude |
| Wire A | | | | |
| Wire B | | | | |
| Wire C | | | | |



Activity Steps:

1. Turn the compass so that the red arm is pointing "N". Using masking tape, tape the compass to table. **You will not be moving the compass during this activity.**
2. Using the battery, 3 wires, and 2 round bulbs create the circuit shown above. Disconnect the loop and place a wire over the compass.
⇒ **DO NOT** connect the compass to the circuit (it is going to be used as a detector).
3. Connect the loop so that the round bulbs light up. Place *Wire A* over the compass.
4. Record the direction (east or west) and the magnitude (how many degrees) of the compass deflection. **Disconnect the circuit.**
5. Rotate the circuit around on your table until *Wire B* is aligned over the compass needle.
⇒ ***Wire B* should be in the same position as *Wire A* was previously.**
6. Record the direction and the magnitude of the compass deflection. **Disconnect the circuit.**
7. Repeat for *Wire C*.
8. **Reverse the batteries in the battery pack. Repeat steps #3-7.**

Follow up:

1. What do you think might be changing in the wires to make the compass change direction when the battery position is reversed? **Explain your reasoning.**
2. Some people think there is something moving in the wires. Is there any **direct evidence of this? Explain.**
3. **If** something is moving in the wires, does the direction of movement and the amount of movement appear to be the same in every wire of this circuit at one time? **What is the evidence?**
4. Describe the direction of charge motion in each wire when the battery pack is reversed.
5. What do you think the battery does in the circuits? What is your evidence?
6. What does this investigation tell you about charge flow into a bulb compared to charge flow out of a bulb? [HINT: LOOK AT THE RECORDED MAGNITUDES!!]
7. For the initial battery position
 - a. **Sketch** a simple picture of the circuit you used in this lab.
 - b. **Use arrows** to show the direction of the **current** in each wire.
 - c. **Is it in the same direction or different directions?**